



Kirtland Air Force Base



Annual Consumer Confidence Report on the Quality of Drinking Water 2004 Operating Year



During 2004, Kirtland AFB remained committed to ensuring delivery of high quality water. Team members from Bioenvironmental Engineering, Civil Engineering, Office of the Judge Advocate, Environmental Management, and Public Affairs worked together to provide the community with information regarding our water resources and water quality. Reading this report will provide you with valuable insight and understanding of Kirtland AFB water quality issues from the source to the tap and how they pertain to you. Should you have any questions regarding this report, contact Bioenvironmental Engineering at 846-4259.

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Kirtland Air Force Base Water System Information



This is the annual report on the quality of water delivered by Kirtland Air Force Base (AFB) during calendar year 2004. Under the "Consumer Confidence Reporting Rule" of the federal Safe Drinking Water Act (SDWA), community water systems are required to report water quality information to the consuming public. As required by regulation, results reported in 2005 are based upon samples collected and analyzed in 2004. This report presents information on the source of our water, its constituents and the health risks associated with any contaminants. Sources of drinking water include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material from geologic formations. Water may also pick up substances resulting from the presence of animals or human activity or from the piping used to carry the water.

Contaminants that may be present in source water include:

- ◆ *Microbial contaminants*, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

- ◆ *Inorganic contaminants*, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- ◆ *Pesticides and herbicides*, which may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses.
- ◆ *Organic chemical contaminants*, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production. Organic chemical contaminants can also come from urban stormwater runoff and septic systems.
- ◆ *Radioactive contaminants*, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of contaminants. *The presence of contaminants does not necessarily indicate the water poses a health risk.* More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 800-426-4791 or going to their website: www.epa.gov/safewater.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer, persons undergoing chemotherapy, persons who have had organ transplants, people with HIV/AIDS or other immune system disorders, the elderly and infants can be particularly



at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at 800-426-4791.

The drinking water delivered to you is pumped from a ground water source known as the Albuquerque Basin Regional Aquifer from the Santa Fe Formation. Kirtland AFB is capable of drawing its water from 8 different wells within the Albuquerque Basin Aquifer. In 2004, a total of 960 million gallons of water were pumped from these wells. The water from the wells is mixed, chlorinated, stored and distributed. Chlorination is the only treatment process performed to prevent bacteria from growing while the water is stored and distributed through the system. Additionally, water pumped and treated by the City of Albuquerque is distributed throughout the base during periods of high water demand or low water levels. A total of 8.8 million gallons of water was purchased from the city of Albuquerque in 2004. *The city of Albuquerque's Consumer Confidence Report is attached for your convenience. You can also access the report on the city's website at www.cabq.gov/waterquality.*

Monitoring Kirtland Air Force Base Drinking Water

Our staff uses EPA-approved sampling and laboratory methods to monitor your drinking water. Bioenvironmental Engineering staff collects water samples from the entry points into the water distribution system, from residents' taps, and from other representative points throughout the distribution system. These samples are shipped to a certified laboratory where all of the required water quality analyses are performed. Listed below are the types of contaminant groups Kirtland AFB monitors in its drinking water and how often monitoring is performed for each group.

Contaminant Group	Monitoring Frequency
Biological Contaminants (total coliform group)	Weekly
Total Trihalomethanes (TTHMs)	Quarterly
Haloacetic Acids (HAA5)	Quarterly
Nitrates & Nitrites	Annually
Lead and Copper	Once every 3 years
Inorganic Chemicals (IOCs)	Once every 3 years
Volatile Organic Compounds	Once every 3 years
Synthetic Organic Compounds	Once every 3 years
Sodium	Once every 3 years
Radionuclides	Four quarterly samples every 4 years
Unregulated Contaminants	Once every 5 years
Asbestos	Once every 9 years

Kirtland Air Force Base Source Water Assessment

Through the 1996 reauthorization of the Safe Drinking Water Act, Congress authorized the U.S. Environmental Protection Agency to require each state to develop and implement a Source Water Assessment and Protection Program. The New Mexico Source Water Assessment and Protection Program is part of the national effort to gather information on public drinking water source areas, and to inform water consumers about any risks to their water supply posed by potential sources of contamination. The Source Water Assessments of public water systems throughout New Mexico include four basic steps:

1. Determining the source water protection area for the community's water system;
2. Taking inventory of potential contaminant sources within the source water protection area;
3. Determining the susceptibility of the water supply to potential sources of contamination; and
4. Making the assessment available to the public.

During 2002, the New Mexico Environment Department – Drinking Water Bureau (NMED-DWB) conducted site visits, collected information on Kirtland AFB's production wells, and identified materials used or stored in the areas around Kirtland AFB wells that could be potential contaminants. As part of the assessment, wells are ranked on a **Susceptibility** scale (see DEFINITION below). The Susceptibilities of Kirtland AFB wells range from moderate to moderately high. These rankings are largely influenced by the presence of possible contaminants that exist on an active Air Force installation as part of normal operations (i.e. vulnerability). However, the characteristics of the water supply wells themselves (i.e. sensitivity) are all moderately low to moderate, meaning the wells are unlikely to become contaminated.

The Kirtland AFB Environmental Management Branch manages a comprehensive program that ensures base facilities comply with environmental laws and regulations. The program includes air, water, petroleum storage tank, hazardous material/waste, and solid waste compliance activities as well as site investigation and restoration activities. Even though potential sources of contaminants exist around Kirtland AFB water supply wells, these potential sources of contamination are closely managed and monitored under the Kirtland AFB Environmental Management program.

The NMED-DWB evaluation is presented in an August 21, 2002 report titled, "Source Water Assessment of Kirtland Air Force Base Water System – Public Water Supply System #NM 35 677 01." The 2002 report remained applicable to the Kirtland AFB water supply system in 2004.

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DEFINITION: Source Water Susceptibility

A water system's susceptibility is a combination of 1) the *sensitivity* of the water source to contamination due to characteristics of the source area and of the wells, and 2) the *vulnerability* of the water source to contamination due to the prevalence and proximity of possible contaminants in the areas around the wells. As a result of industrial operations and materials in a well area, the well's vulnerability may be somewhat higher. However, the sensitivity of the water source may be lower because there is a lesser chance of the well actually being contaminated due to the well's depth and construction. The susceptibility ranking scale ranges from "high," "moderately high," "moderate," "moderately low" or "low."

Table of Detected Compounds

Detected Compounds	MCLG	MCL (or AL)	Level Detected	Results Ranged From:	Sample Dates	Exceeded MCL? (yes/no)	Likely Source of Contaminant
Total Coliforms	0	1/month	0	0		No	Naturally present in the environment or sample collection/laboratory error
Nitrate, as N	10 ppm	10 ppm	8.3 ppm	0.18 – 8.3 ppm	14-Jul-04	No	Runoff from fertilizer use or sewage
Copper	1300 ppb (AL)	1300 ppb (AL)	70.8 ppb ⁽¹⁾	6 - 82 ppb	15-Aug-03 ⁽²⁾	No ⁽²⁾	Corrosion of household plumbing systems
Lead	0	15 ppb (AL)	2 ppb ⁽¹⁾	ND – 2 ppb	15-Aug-03 ⁽²⁾	No ⁽²⁾	Corrosion of household plumbing systems
Antimony	6 ppb	6 ppb	2 ppb	ND – 2 ppb	20-Aug-03 ⁽²⁾	No	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	0	50 ppb ⁽³⁾	21 ppb	1 – 21 ppb	21-May-03 ⁽²⁾	No	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes
Barium	2 ppm	2 ppm	0.14 ppm	0.05 – 0.14 ppm	20-Aug-03 ⁽²⁾	No	Erosion of natural deposits
Chromium (Total)	0.1 ppm	0.1 ppm	0.002 ppm	0.001 - 0.002 ppm	20-Aug-03 ⁽²⁾	No	Discharge from steel and pulp mills; erosion of natural deposits
Fluoride	4 ppm	4 ppm	0.56 ppm	0.34 – 0.56 ppm	21-May-03 ⁽²⁾	No	Erosion of natural deposits
Selenium	50 ppb	50 ppb	4 ppb	1 – 4 ppb	20-Aug-03 ⁽²⁾	No	Discharge from electronics and drug factories
Sodium	NA ⁽⁴⁾	NA ⁽⁵⁾	33.6 ppm	27.3 – 33.6 ppm	20-Aug-03 ⁽²⁾	No	Erosion of natural deposits.
Gross Alpha Particle Activity	0	15 pCi/L	5.6 pCi/L	0.9-5.6 pCi/L	2003 ⁽²⁾⁽⁶⁾	No	Erosion of natural deposits
Gross Beta Particles & Photon Emitters	0	4 rem/yr ⁽⁵⁾ (50 pCi/L)	7.4 pCi/L	2.8-7.4 pCi/L	2003 ⁽²⁾⁽⁶⁾	No	Decay of natural and manmade deposits
Total Trihalomethanes	0	80 ppb	4.4 ppb ⁽⁷⁾	1.27 - 9.95 ppb	2004	No	By-product of drinking water disinfection
⁽¹⁾ This value represents the 90th percentile value, used for compliance reporting. 90% of results in the test set were below this level. ⁽²⁾ These data represent the most recent round of sampling. ⁽³⁾ The MCL is 50 ppb until January 23, 2006. Drinking water systems will be required to comply with the new MCL of 10 ppb after that date. ⁽⁴⁾ Not Applicable. The EPA does not have a MCLG or MCL for sodium. ⁽⁵⁾ 4 mrem/yr represents an annual dosage; 50 pCi/L represents a concentration. The EPA considers 50 pCi/L to be the level of concern for beta particles. ⁽⁶⁾ Samples were collected once per quarter for four consecutive quarters starting in the second quarter of 2003 through the first quarter of 2004. ⁽⁷⁾ This represents the annual average of four quarterly test results, the value used for compliance reporting. The range represents the range of actual detected concentrations.							

ACRONYMS AND COMMONLY USED TERMS IN THIS REPORT

AL	Action Level; the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a system must follow.
MCLG	Maximum Contaminant Level Goal; The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs have a built in margin of safety.
MCL	Maximum Contaminant Level; The highest level of a contaminant that is allowed in drinking water. MCLs are set as close as possible to the MCLG.
MDL	Method Detection Level; The lowest concentration of a contaminant that can be detected using the required EPA sampling and analysis methods. A MDL is specific for each contaminant and type of analysis performed.
ND	Not Detected; the element is not present at a level above the detection limit of laboratory instruments.
pCi/L	picocuries per liter, A measure of radioactivity in water.
ppb	parts per billion, a unit of measure equivalent to a single penny in \$10,000,000.
ppm	parts per million, a unit of measure equivalent to a single penny in \$10,000.
Range	The range from the highest to the lowest reported analytical values for a contaminant for the most recent EPA sampling period. The EPA requires this range to be reported.

Kirtland Air Force Base Source Water Assessment (cont)



The Safe Drinking Water Act requires that the results of this assessment be available to water consumers. To meet this requirement, NMED-DWB will provide copies of this report to the public upon request. To obtain a copy of the Kirtland AFB Source Water Assessment, contact the NMED-DWB in Santa Fe, NM, toll free at 1-877-654-8720 or email them at SWAPP@nmenv.state.nm.us. Copies of the report are also available to consumers who contact the Kirtland AFB Environmental Management Office at 846-8577.

Detected Compounds

We monitor various constituents in the water supply to meet all regulatory requirements. The Detected Compounds table lists only those compounds that were detected at levels equal to or greater than laboratory method detection limits (MDLs). All detected compounds were at concentrations below the maximum contaminant level. Many other compounds are analyzed but were not present or were below the detection limits of the laboratory equipment in 2004.

Compliance with National Primary Drinking Water Regulations

No compounds detected in Kirtland AFB drinking water during 2004 were at levels exceeding the EPA MCLs.

Information on Lead, Copper, Nitrate, Arsenic, and Fluoride

Kirtland AFB water does not exceed regulatory levels for lead, copper, nitrate, arsenic, or fluoride. However, consumers often inquire about these compounds. So, some information is provided below.

Lead and copper rarely occur naturally in drinking water at levels above national standards. Too much lead in the human body can cause negative health effects including serious damage to the brain, kidneys, nervous system and red blood cells. Long-term exposure to high levels of copper can result in stomach and intestinal problems. Young children and infants tend to be more sensitive to high levels of these compounds. Lead and copper are most commonly found in household drinking water when the plumbing system has corroded. This is not usually a concern in older homes (built before 1982) because a protective mineral layer has built up inside the pipes. A significant source of lead in household water is from lead solder used to join pipes. The use of lead solder was discontinued in New Mexico in 1987. Kirtland AFB sampling for lead and copper have not indicated levels exceeding the applicable MCLs.

During 2003, levels of nitrate in Kirtland AFB production Well 11 were detected at over one half of the EPA MCL. The level triggered a requirement to perform 4 consecutive quarters of repeat monitoring. The fourth and final repeat sampling event occurred in 2004. In order to complete the repeat sampling and also due to other operational issues, water from Well 11 was not pumped into the drinking water system in 2004. All sample results were below one half of

the MCL. The well is in compliance with the standard and sampling will return to an annual basis in 2005. Water with nitrate levels greater than 10 ppm is a risk to infants under 6 months of age and can result in "blue baby syndrome." There have not been any reported cases of "blue baby syndrome" at Kirtland AFB. If you have questions you can contact the Medical Group Pediatric Clinic at 846-3200.

The 1996 Amendments to the Safe Drinking Water Act required EPA to review the 50 parts per billion (ppb) standard for arsenic in drinking water. In January 2001, EPA published the new standard for arsenic in drinking water that required public water supplies to reduce arsenic levels to 10 ppb. Kirtland AFB is required to comply with the new standard by January 2006.

Arsenic is a naturally occurring element in the groundwater below Kirtland AFB. Compliance sampling for arsenic was most recently conducted during the calendar year 2003 and showed arsenic levels in Kirtland AFB's drinking water ranging from 2 ppb to 21 ppb. Compliance sampling for arsenic was not required during calendar year 2004. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.



Kirtland AFB has evaluated several alternatives to ensure arsenic compliance with the new MCL by 2006. Based on evaluations, and results of long-term sampling conducted at each active production well, a water blending method has been selected. A project to install new waterlines, storage tanks, and other water system components was initiated in February 2005 and is scheduled to be completed by December 2005. The photo above shows construction underway at one of the new water tank sites. Kirtland AFB's Environmental Management Branch will continue quarterly sample collection at active production wells to monitor arsenic levels. Data will be used by the water system operators to ensure that the blended water provided to consumers on Kirtland AFB is below the new arsenic MCL.

The Kirtland AFB water system is not required to perform supplemental fluoridation of the base's drinking water under state or federal regulations. When naturally occurring fluoride levels are between 0.3 - 0.6 ppm (as they are in Kirtland AFB drinking water), the Centers for Disease Control and Prevention recommend that children 3-16 years of age receive a dietary fluoride supplement. If you have questions about whether you or your dependents may need fluoride supplements, you should call the Medical Group Pediatric Clinic at 846-3200, Option 5.

Public Involvement

Members of Bioenvironmental Engineering, Civil Engineering, Environmental Management, Office of the Judge Advocate and Public Affairs, along with CH2M HILL, prepared this Consumer Confidence Report. For questions on this report or water quality at Kirtland AFB, contact Bioenvironmental Engineering at 846-4259.